

Fertility and Mortality 1950-1974 in the Upernavik District, Greenland

Anders Green¹ and Niels Kromann²

From ¹The Institute of Clinical Genetics, Odense University, Denmark, and

²The Hospital, Upernavik, Greenland

Fertility and mortality 1950-1974 in the Upernavik district, Greenland. Green, A. & Kromann, N. (The Institute of Clinical Genetics, Odense University, Denmark, and The Hospital, Upernavik, Greenland).

Scand J Soc Med 1983, 3 (69-73).

A descriptive study of fertility and mortality in a Greenlandic whaling and sealing community of approximately 1800 individuals during the period 1950-74 was performed on the basis of data from parish records and medical reports. Fertility was on the increase until approximately 1960 after which it declined considerably. No significant reduction in the high stillbirth and infant mortality rates could be demonstrated. A considerable reduction in overall mortality was observed and could be attributed to the eradication of tuberculosis as a cause of death. The results are discussed in the light of data from Greenland as a whole, which in general has been characterized by intense industrialization and social development. Further comparative studies in Arctic communities characterized by varying degrees of socio-economic development are recommended.

The Greenlandic population is characterized by high mortality and fertility rates. According to Iversen (8), the average crude annual death rates for the period 1910-50 were 30 per thousand population, but with large variations due to epidemics, primarily whooping cough and influenza. During the same period a high fertility level caused a considerable population growth from 13 000 inhabitants in 1910 to approximately 22 000 in 1950.

However, the situation changed after 1950: a political decision aimed at an industrialization of the original sealing and whaling community. At the same time an attempt was made to improve the standard of hygiene, primarily by a modernization of housing, water supply, and the health service. Furthermore, an extensive mass anti-tuberculosis campaign was carried out in order to reduce the high morbidity and its impact on the mortality due to this disease. The campaign in-

cluded the establishment of a sanatorium with 200 beds and a BCG vaccination programme, together with a seaborne chest clinic which visited yearly all towns and settlements along the west coast of Greenland (where about 90% of all Greenlanders live).

The combined effect of these measures on the mortality has been described for the whole Greenlandic population (1, 8). However, the population represents a very mixed group of small communities with differing socio-economic structures and varying stages of development; therefore, it cannot be excluded that the changes in fertility and mortality have varied between the different districts.

In order to provide baseline data for future comparative studies we have performed a descriptive study of fertility and mortality during 1950-74 in one of the few remaining sealing and whaling districts in Greenland. An epidemiological survey has been presented previously (9).

MATERIALS AND METHODS

Study population

The study included all persons of Greenlandic descent in the Upernavik district in Northwest Greenland and covered the period January 1, 1950 to December 31, 1974, during which the population size increased from 1398 to 1887.

The district represents a typical sealing and whaling community with hunting of sea mammals, fish and sea birds as the principal occupation, and during the study period only limited social development took place, primarily in the public sector (administration, educational system). The conditions and the development in the district have been described elsewhere (9).

Study materials

The parish records were perused and from them the annual numbers of children born of mothers with a permanent address in the district and place of birth in

Rec'd: MAR 25 1985

Order No.1

Price: 1LL photocopy

Health & Welfare Canada

Scand J Soc Med 11

POLAR
PAM
281

POLARPAM

BOREAL INSTITUTE
LIBRARY

062648

Table I. Estimated person-years observed, distributed according to age, observation period and sex; Upernavik district, Greenland

M: Males; F: Females

Age class (years)	Observation period									
	1950-1954		1955-1959		1960-1964		1965-1969		1970-1974	
	M	F	M	F	M	F	M	F	M	F
0-6	644	665	880	794	1 282	1 129	1 427	1 238	1 145	1 023
7-14	703	772	589	645	742	761	1 133	1 018	1 414	1 258
15-24	746	750	620	623	562	580	514	501	702	671
25-39	571	613	629	624	777	770	825	802	759	735
40-64	667	657	591	594	644	665	675	690	703	708
65+	57	126	74	98	117	105	155	138	183	193
Total	3 388	3 583	3 383	3 378	4 124	4 010	4 729	4 387	4 906	4 588

Greenland were obtained; in the same way we recorded the annual numbers of deaths of persons, born in Greenland and with a permanent address at the time of death in the district. A few supplementary cases were obtained from a cross-checking with the annual reports from the

Table II. Population size, live births, stillbirths and deaths 1950-1974; Upernavik district, Greenland

M: Males; F: Females

Calendar year	Population size ^a		Live births		Still- births		Deaths	
	M	F	M	F	M	F	M	F
1950	679	719	24	34	0	1	23	19
1951	682	737	28	32	5	5	14	16
1952	702	735	30	26	2	1	9	20
1953	687	736	31	35	0	4	11	18
1954	638	656	29	24	0	3	7	14
1955	643	649	43	24	0	0	10	10
1956	638	642	27	23	2	0	10	11
1957	674	673	35	38	0	2	7	11
1958	704	691	41	40	0	1	11	6
1959	724	723	41	42	0	0	10	10
1960	765	767	52	41	0	1	15	4
1961	787	771	40	42	4	1	13	9
1962	812	789	56	30	0	2	10	11
1963	862	838	55	64	1	1	5	17
1964	894	845	53	37	3	0	12	8
1965	934	864	49	42	1	2	11	6
1966	953	885	54	47	2	2	14	9
1967	950	896	40	42	2	0	15	8
1968	956	876	40	33	0	0	14	12
1969	936	866	34	38	1	0	14	14
1970	956	899	29	30	2	0	14	10
1971	974	912	31	30	1	3	5	3
1972	1 011	945	34	32	0	0	11	6
1973	992	918	26	30	1	3	11	10
1974	973	914	24	20	1	2	9	10
Total			946	876	28	34	285	272

^a Source: Ref. (1).

Table III. Infant deaths
d: days; y: years

Stillbirths
Stillbirth rate (per 1 000 b
95 % confidence limits

Infant deaths
Age at death
0 d
1-7 d
8-28 d
29 d-1 y
Total

Infant mortality rate (per
95 % confidence limits

confidence limits as v
number from 1950-64
1965-74 ($X^2_1=1.22$, 0.20
of infant deaths at v
the first year of life v
study period, and ap
occurred within the fir

The number of death
total population is sh
with corresponding es
adjust for changes in
show the standard n
mortality rate (crude a
approximately halved
of the study period, b
1950-54 to 1955-59.
sexes and all age clas
do not permit of a prop

All deaths except
allocated to the follow
death: (1) tuberculos
tions); (2) all other
homicides and suici
unspecified causes
numbers have been s
parisons between dif
in consequence and l
infant deaths, the figu
ly comparable with th
major trend observed v
due to tuberculosis w
decrease in the numbe

District Medical Officer, filed in the Chief Medical Officer's archives in Nuuk (Godthåb).

Cause of death was recorded from the death certificates (mandatory in Greenland since 1967) which are filed at the Public Health Board archives, Copenhagen. For deaths before 1967 the information was obtained from the District Medical Officer's annual reports.

Data on age structure (six age groups) were obtained from censuses (2-5), carried out at approximately 5-year intervals. By interpolation we have estimated the numbers of person-years observed for each age and sex class in various parts of the total study period (Table I).

RESULTS

A survey of the basic data is given in Table II. Altogether 1 884 births were recorded during the study period; the sex ratio (male/female) was 974:910=1.07. The annual birth rates (calculated from Table II) showed a generally increasing trend from appr. 45 to appr. 70 births per 1 000 population in 1950 and in 1963, respectively, after which the rates declined rapidly to appr. 30 per 1 000 in 1974.

The number of stillbirths and estimated stillbirth rates (with 95%-confidence limits) are shown in the upper panel of Table III. Except for a relatively small rate in 1955-59, no significant differences between the various observation periods were found as judged by comparisons of the confidence limits: a traditional χ^2 -analysis of the number from 1950-64 compared with that from 1965-74 was insignificant ($X^2_1=0.07$, $0.70 < p < 0.80$).

The number of infant deaths and corresponding estimated rates (with 95%-confidence limits) are shown in the lower panel of Table III. The rates decreased during the study period, but no significant trend was detected, based on inspection of the

Digitized by the Internet Archive
in 2022 with funding from
University of Alberta Libraries

Table III. Infant deaths and stillbirths 1950-1974, both sexes combined; Upernavik district, Greenland
d: days; y: years

	Number of deaths in the observation period				
	1950-54	1955-59	1960-64	1965-69	1970-74
<i>Stillbirths</i>	21	5	13	10	13
Stillbirth rate (per 1 000 births)	66.9	13.9	26.9	23.3	43.5
95% confidence limits	38.7-95.1	1.6-26.3	12.2-41.6	8.7-37.9	19.9-67.1
<i>Infant deaths</i>					
Age at death					
0 d	6	7	3	6	3
1-7 d	7	2	9	7	5
8-28 d	3	1	11	1	0
29 d-1 y	22	19	19	23	13
Total	38	29	42	37	21
Infant mortality rate (per 1 000 live births)	129.7	81.9	89.4	88.3	73.4
95% confidence limits	90.4-168.9	52.8-111.1	63.0-115.7	60.6-116.0	42.6-104.3

confidence limits as well as a χ^2 -analysis of the number from 1950-64 compared with that from 1965-74 ($\chi^2_1=1.22$, $0.20 < p < 0.30$). The proportions of infant deaths at various age intervals during the first year of life were similar throughout the study period, and appr. one-third of the deaths occurred within the first week of life.

The number of deaths (excluding stillbirths) in the total population is shown in Table IV, together with corresponding estimated mortality rates. To adjust for changes in the age structure we also show the standard mortality rates. The overall mortality rate (crude as well as standardized) was approximately halved from the beginning to the end of the study period, being most pronounced from 1950-54 to 1955-59. This trend applied to both sexes and all age classes, but the small numbers do not permit of a proper statistical analysis.

All deaths except infant deaths have been allocated to the following categories of *causes of death*: (1) tuberculosis (including late complications); (2) all other diseases; (3) accidents; (4) homicides and suicides, and (5) unknown or unspecified causes (Table V). The observed numbers have been standardized to permit comparisons between different observation periods; in consequence and because of the exclusion of infant deaths, the figures in Table V are not directly comparable with those from Table IV. The only major trend observed was that practically no deaths due to tuberculosis were recorded after 1960; the decrease in the number of tuberculosis deaths was

roughly equivalent to the reduction in the total standardized number of deaths.

DISCUSSION

The main reason for using the parish records as data source was that official reports may be inaccurate; furthermore, a special naming tradition makes a distinction between Greenlanders and foreigners (mainly Danes) possible; finally, events included in the official reports do not always refer to the year in which the event in fact took place, as do the parish records.

The birth rates in Upernavik district corresponded very well to those from Greenland as a whole until 1960 (1). In the 1960's the Intra-Uterine Device was introduced in Greenland, followed by a considerable decrease from 45 births per 1000 population in 1960 to 20 per 1000 in 1974 in Greenland (1). The same trend after 1960 was found in Upernavik, but the birth rates were slightly higher than in all of Greenland; thus it was appr. 30 per thousand in 1974 (Table II).

Though a reduction of the stillbirth rate in Upernavik district from the early to the latter part of the study period was observed, it was insignificant. In Greenland as a whole the rate gradually decreased, from appr. 40 to appr. 15 stillbirths per 1000 births in 1950 and 1974, respectively; this trend might be attributed to improvements in maternity health care brought by the introduction of a short formal education of Greenlandic mater-

65-1969

F	
(0.015)	26 (0.021)
(0.003)	0 (-)
(0.002)	1 (0.002)
(0.008)	1 (0.001)
(0.022)	11 (0.016)
(0.135)	10 (0.072)
(0.014)	49 (0.011)
0.014	0.011

were considerably higher rates, for example.

Our study confirmed findings (8, 10) that tuberculosis was a cause of death by 1960, counterbalanced the decrease in deaths due to causes remained fairly constant period. Of particular interest number of homicides and previous findings from fact that many deaths taken resulting in scant knowledge (hand information) when the certificate, made a detailed report of causes of death. It seems justified to consider a separate cause of death, or previously diagnosed tuberculosis to the doctor from the mass.

In summary, our study general demographic features of the population, i.e. a high fertility, considerable reduction in the overall mortality rate attributed to the eradication of tuberculosis as a cause of death. However, it indicated that the stillbirth rates have been rather stable in the population in spite of the decreased considerable in

Table IV. Number of deaths (in parantheses: mortality rate) and standard mortality rates^a 1950–1974, specified according to observation period, age at death and sex; Upernavik district, Greenland

M: Males; F: Females

Age at death (years)	Observation period							
	1950–1954		1955–1959		1960–1964		1965–1969	
	M	F	M	F	M	F	M	F
0–6	22 (0.034)	25 (0.038)	17 (0.019)	18 (0.023)	25 (0.020)	23 (0.020)	21 (0.015)	26 (0.021)
7–14	1 (0.001)	4 (0.005)	0 (–)	0 (–)	2 (0.003)	1 (0.001)	3 (0.003)	0 (–)
15–24	8 (0.011)	11 (0.015)	3 (0.005)	3 (0.005)	4 (0.007)	1 (0.002)	1 (0.002)	1 (0.002)
25–39	8 (0.014)	16 (0.026)	5 (0.008)	7 (0.011)	8 (0.010)	3 (0.004)	7 (0.008)	1 (0.001)
40–64	20 (0.030)	19 (0.029)	21 (0.036)	11 (0.019)	6 (0.009)	15 (0.023)	15 (0.022)	11 (0.016)
65+	5 (0.088)	12 (0.095)	2 (0.027)	9 (0.092)	10 (0.085)	6 (0.057)	21 (0.135)	10 (0.072)
Total	64 (0.019)	87 (0.024)	48 (0.014)	48 (0.014)	55 (0.013)	49 (0.012)	68 (0.014)	49 (0.011)
Standard mortality rate ^a	0.020	0.025	0.013	0.014	0.013	0.012	0.014	0.011

^a Standard population: Age structure identical with that for the period 1970–74.

nity assistants and by urging pregnant women to attend the district hospital for their confinement. However, we have been unable to demonstrate any significant effect of these efforts with regard to the stillbirth rate in our study population.

While the infant mortality rate in all of Greenland showed a dramatical decrease from about 150 per 1000 live births in the early 1950's to appr. 30 per 1000 in 1974 (1), we could not identify any corresponding significant trend in Upernavik district, though the same tendency was observed. One explanation could be that the district is large, with the majority of the population living far from medical aid; thus one would expect a higher number of infant deaths due to acute diseases that would

under other circumstances have been cured. Also, with respect to infant mortality, no effects of the attempted improvements in maternity health care could be identified in our study population, because the proportion of infant deaths occurring during the first week of life remained constant throughout the study period.

The mortality level in Upernavik district declined during the study period, and a similar trend has been found for all Greenland (1). In 1970–74 the overall mortality rate in the study population was similar to overall mortality rates from most Western societies, but against the background of the very high proportion of young individuals in the Greenlandic population, all age-specific mortality rates

were considerably higher rates, for example.

Our study confirmed findings (8, 10) that tuberculosis is a cause of death by 1960 counterbalanced the decrease in study population (Table 1). Deaths due to causes remained fairly constant during the study period. Of particular interest was the number of homicides and previous findings from the fact that many deaths taken resulting in scant knowledge (hand information) when the certificate, made a detailed contribution of causes of death, it seems justified to consider a separate cause of death, or previously diagnosed tuberculosis to the doctor from the mass

In summary, our study of the general demographic features of the population, i.e. a high fertility rate, a considerable reduction in the overall mortality rate, be attributed to the eradication of a cause of death. However, it is indicated that the stillbirth rates have been rather high in the population in spite of the decreased considerable in

Table V. Standardized^a numbers of deaths, distributed into causes, sex, and observation periods, infant deaths excluded; Upernavik district, Greenland

M: Males; F: Females

Cause of death	Observation period									
	1950–54		1955–59		1960–64		1965–69		1970–74	
	M	F	M	F	M	F	M	F	M	F
Tuberculosis	27.1	26.3	4.7	5.7	0.0	0.0	1.2	0.0	0	0
Other diseases	22.6	44.5	19.3	32.7	22.7	26.7	36.8	30.3	19	22
Accidents	9.5	3.3	13.3	8.1	17.7	3.8	11.7	0.8	14	3
Homicide, suicide	0.0	1.2	3.5	0.0	1.2	1.0	4.7	1.3	7	1
Unknown or unspecified	8.5	3.8	1.2	1.2	1.6	2.1	0.8	0.0	0	2
Total	67.7	79.1	42.0	47.7	43.2	33.6	55.2	32.4	40	28

^a Actual numbers are standardized to the age structure of the period 1970–74.

1965-1969		1970-1974	
M	F	M	F
1 (0.015)	26 (0.021)	11 (0.010)	11 (0.011)
3 (0.003)	0 (-)	3 (0.02)	2 (0.002)
1 (0.002)	1 (0.002)	5 (0.007)	1 (0.001)
7 (0.008)	1 (0.001)	8 (0.011)	5 (0.007)
5 (0.022)	11 (0.016)	14 (0.020)	11 (0.016)
1 (0.135)	10 (0.072)	9 (0.049)	9 (0.047)
8 (0.014)	49 (0.011)	50 (0.010)	39 (0.009)
0.014	0.011	0.010	0.009

were considerably higher, compared with Danish rates, for example.

Our study confirmed findings from all Greenland (8, 10) that tuberculosis in general was eradicated as a cause of death by 1960; this eradication roughly counterbalanced the decrease in mortality in our study population (Table V). Thus the number of deaths due to causes other than tuberculosis remained fairly constant throughout the study period. Of particular interest is the relatively high number of homicides and suicides, which confirms previous findings from all Greenland (7). The fact that many deaths take place in remote areas, resulting in scant knowledge only (often second-hand information) when the doctor issues the death certificate, made a detailed analysis of the distribution of causes of death impossible; however, it seems justified to consider tuberculosis as a separate cause of death, as all persons with active or previously diagnosed tuberculosis will be known to the doctor from the mass campaign.

In summary, our study has confirmed some general demographic features of the Greenlandic population, i.e. a high fertility level but with a considerable reduction since the 1960's and a reduction in the overall mortality which can mainly be attributed to the eradication of tuberculosis as a cause of death. However, the study also has indicated that the stillbirth and infant mortality rates have been rather constant in the study population in spite of the fact that both rates have decreased considerable in Greenland as a whole.

This difference might be explained by the fact that our study population, in contrast to the general Greenlandic population, has undergone only a limited industrial and social development. Therefore we recommend that comparative studies in communities with varying degrees of development should be performed in order to elucidate in detail the demographic consequences of the industrialization and social development in Arctic populations.

ACKNOWLEDGEMENTS

We wish to thank Professor Bent Harvald who has given valuable help through all phases of the study and Dr P.H. Alsbrink and Professor Mogens Hauge who offered valuable criticism. The study was made possible by permission from the Chief Medical Officer in Greenland, the Commission for Scientific Research in Greenland and the District Medical officer in the Upernavik district.

Financial support was obtained from the Danish Medical Research Council (grant no. 512-8623) and the Commission for Scientific Research in Greenland.

REFERENCES

1. Chief Medical Officer in Greenland. The State of Health in Greenland. Annual reports for the years 1950-1974, incl.
2. Danmarks Statistik. Statistiske Efterretninger (Statistical News) no. 69, 1956.
3. Danmarks Statistik. Statistiske Efterretninger (Statistical News) no. 24, 1962.
4. Danmarks Statistik. Statistisk Tabelværk (Statistical Table Work) no. IX, 1969.
5. Danmarks Statistik. Statistisk Tabelværk (Statistical Table Work) no. VI, 1974.
6. Fog-Poulsen, M.: Dødsårsagerne i Grønland (Causes of death in Greenland). Ugeskr. Læger 118: 963-967, 1956.
7. Hansen, J.P.H.: Drab i Danmark 1946-1970. En retsmedicinsk undersøgelse (Homicide in Denmark. A Medico-legal Investigation) p. 30. Munksgaard, Copenhagen, 1977.
8. Iversen, E.: Epidemiological basis of tuberculosis eradication 11. Mortality among tuberculosis cases and the general population of Greenland. Bull WHO 45: 667-687, 1971.
9. Kromann, N. & Green, A.: Epidemiological studies in the Upernavik district, Greenland. The incidence of some chronic diseases 1950-1974. Acta Med Scand 208: 401-406, 1980.
10. Stein, K. P. S., Lange, P. K., Gad, U. and Wilbek, E.: Tuberculosis in Greenland. Arch Environ Health 17: 501-506, 1968.

Address for offprints:

Dr Anders Green
University Institute of Clinical Genetics
J. B. Winsløvsvej 17
DK-5000 Odense C
Denmark

Date Due

62648

Pam:312: (*384)
GRE

A GREEN, Anders and KROMANN, Niels
Fertility and mortality
1950-1974 in the Upernavik
T district, Greenla

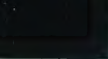
Borrower's Name	Date Due

62648

Pam:312: (*384)
GRE

GREEN, Anders and KROMANN, Niels
Fertility and mortality
1950-1974 in the Upernavik
district, Greenla

BOREAL INSTITUTE FOR NORTHERN STUDIES, LIBRARY
CW 401 BIOLOGICAL SCIENCES BLDG.
THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA T6G 2E9
CANADA



University of Alberta Library



0 1620 0328 1175